REMARKS

This communication is a full and timely response to the aforementioned non-final Office Action dated December 31, 2007. By this communication, claims 1 and 5-9 are cancelled, without prejudice or disclaimer to the underlying subject matter, claims 3, 4, 10, and 12 are amended, and claims 14 and 15 are added. Support for the amended subject matter can be found, for example, on page 13, lines 24-31 and page 19, line 25 - page 20, line 5 of the disclosure. Claims 3, 4, and 10-15 remain pending, where claim 2 was previously cancelled. Reconsideration and allowance of this application are respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 3, 4, and 10-12 were rejected under 35 U.S.C. §103(a) as unpatentable over *Naone et al* (U.S. Patent No. 6,898,215) in view of *Yang et al* (U.S. Patent No. 6,716,378). Applicants respectfully traverse this rejection.

The *Naone* and *Yang* patents fail to establish a *prima facie* case of obviousness because they do not teach every element recited in Applicants' claims.

As provided in Applicants' disclosure, a conventional vertical cavity surface emitting laser (VCSEL) has luminous intensity that depends on a current density of the device. As a result the area of a light emitting section can be reduced. This feature, in turn, enables an area of mesa section to be reduced and an area of an electrode pad to be increased. Accordingly, the capacitance formed between the electrode pad and the substrate is large. The increased capacitance prevents a modulating speed of the laser to be increased. Moreover, when a polyimide layer is formed to surround the mesa section, the mesa section experiences a high amount of stress. Consequently, the polyimide layer peels away from the mesa section due

to a difference in the coefficient of thermal expansion between the two. This peeling deteriorates the reliability of the device.

Applicants' claimed embodiments overcome these deficiencies by having cylindrical vacancies of adjacent porous structures that are oriented in different directions. As a result, the opening portions of the vacancies can be closed so that a thin film having a low dielectric constant and an excellent moisture resistance that is nearly equal to the moisture resistance of a fine film can be formed. In addition, the thin film can embody excellent mechanical strength with a periodic structure. Furthermore, because the vacancies are oriented like layers, a space between the layers is supported by the adjacent layer so that the layered periodic porous shape, which is typically considered to be unstable, can be constructed with a stable and excellent mechanical strength (see page 5, lines 24-36, and page 7, line 30 - page 8, line 24 of Applicants' disclosure). By covering the mesa section of the VCSEL using the inorganic insulating film having porous structure, it is possible to provide a semiconductor light emitting device that can reduce capacitance in a pad section and have a high modulating speed. Moreover, the mesa section having a small mechanical strength is covered with an inorganic insulating film, so that the structure of the mesa section can have increased mechanical strength and a higher reliability (see page 4, lines 16-22 of Applicants' disclosure).

In contrast, the *Naone* patent relates to a VCSEL that emits light having a long wavelength. The *Naone* patent also discloses that a polyimide is used as an insulating film. The polyimide, however, has a higher coefficient of thermal expansion with respect to the mesa section such that the mesa section experiences a high level of stress as discussed above. When a mesa section experiences stress

as such, peeling of the polyimide will occur at the interface such that reliability of the device will deteriorate.

The *Yang* patent is applied to remedy the deficiencies of the *Naone* patent with respect to Applicants' claimed cylindrical vacancies. The *Yang* patent is directed to a method of forming a mesa porous structure. However, this reference fails to teach or suggest that cylindrical vacancies of adjacent porous structures are oriented in different directions, as recited in Applicants' claims. The *Yang* patent is also silent regarding how a layered periodic porous shape that is generally unstable can be constructed so that it is stable and has excellent mechanical strength.

In summary, the *Naone* and *Yang* patents fail to disclose or suggest every element recited in Applicants' claims. Particularly, Applicants' respectfully submit that one of ordinary skill would not have applied the inorganic layer described in the *Yang* patent to the insulating layer of the *Naone* patent as alleged in the Office Action. In fact, the *Yang* patent appears to teach away from forming adjacent porous structures that are oriented in different directions as recited in Applicants' claims, based on the described molding methods of forming porous structures. From this technique, one of ordinary skill would arguably find it impossible to achieve adjacent porous structures that are oriented in different directions as alleged. The Office Action has failed to establish or show support regarding how techniques used to prepare mesoporous materials and mesoscopic structures at different length scales can also be used to form adjacent porous structures that are oriented in different directions. Accordingly, when applied individually or collectively, the *Naone* and *Yang* patents fail to establish a *prima facie* case of obviousness.

The Office is reminded that the Office has the initial burden of establishing a **factual basis** to support the legal conclusion of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), the Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some **articulated reasoning with some rational underpinning** to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (emphasis added). Therefore, withdrawal of this rejection is respectfully requested.

Applicants have added new claims 14 and 15 that recite novel embodiments described in Applicants' disclosure. Favorable consideration and allowance of these claims are respectfully requested.

Conclusion

Based on at least the foregoing amendments and remarks, Applicants submit that claims 3, 4, and 10-15 are allowable, and this application is in condition for allowance. In the event the instant application can be placed in even better form, Applicants request that the undersigned attorney be contacted at the number below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: March 31, 2008 By: _____

Shawn B. Cage
Registration No. 51522

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620